

Cover letter

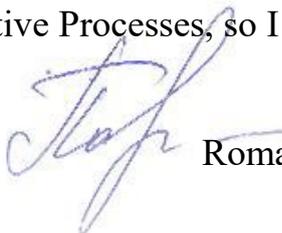
The article is devoted to the study of long waves by N.D. Kondratiev (K-waves), which describe economic cycles and crises. The topic of the research is relevant, as evidenced by the numerous works indicated in this article, which date back to the mid-19th century and continue to the present day.

The research tool is mathematical modeling. In the article, the mathematical model of S.V. was chosen as the basic mathematical model of K-waves. Dubovsky, which describes the dynamics of the efficiency of capital productivity and new technologies, which is based on a system of nonlinear ordinary differential equations. This model gives cyclical dynamics, which can be used for forecasting techniques for economic crises and cycles.

In this article, a series of modifications of the classical mathematical model of S.V. Dubovsky: first, the dependence of the accumulation rate on capital productivity was introduced, and then the external influx of investments and technological solutions. Next, heredity was introduced into the model, which was described using derivatives of fractional constant and variable orders. The memory effect in an economic system leads to some delay in its response to impact. Next, a numerical analysis of the models was carried out using the Adams-Bashforth-Moulton method, the accuracy of the method was proven and demonstrated. The algorithm was implemented in computer programs in Python and Maple. Using computer programs, oscillograms and phase trajectories were constructed for various values of the model parameters, and their interpretation was given.

The subject of the article corresponds to the special issue Fractional Evolutionary Equations and Modeling of Dissipative Processes, so I ask the editors to support this article

15.03.2024


Roman Parovik